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Abundance, Age, Sex, and Size Statistics for Sockeye and Chum Salmon in Lower Cook Inlet, 1991

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

Nine Lower Cook Inlet sockeye *Oncorhynchus nerka* and two chum salmon *Oncorhynchus keta* fisheries targeting primarily discrete stocks were sampled for age, length and weight during the 1991 fishing season. A total of 317,947 sockeye and 24,232 chum salmon were harvested in this management area. Another 46,939 sockeye and 93,395 chum salmon were estimated in the escapement. The dominant ages of sockeye salmon throughout Lower Cook Inlet were 1.2, 1.3, 2.2, and 2.3. The proportion of females in the sockeye salmon samples ranged from 40 to 65%. Sockeye salmon harvested in the Outer and Eastern Districts tended to be larger, 550 mm and 2.00 kg, compared to 480 mm and 1.79 kg in the Southern and Kamishak Districts. The dominant ages for the chum salmon sampled this year were 0.3 and 0.4. The proportion of females in the samples ranged from 55 to 65%. Mean size was between 586 and 629 mm and 3.72 kg.

KEY WORDS: Age, chum salmon, length, Lower Cook Inlet, *Oncorhynchus*, sex, sockeye salmon, weight, pink salmon

INTRODUCTION

The Lower Cook Inlet Management Area for salmon is composed of all waters west of Cape Fairfield in the Gulf of Alaska, north of Cape Douglas in Shelikof Straits, and south of Anchor Point in Cook Inlet. The area is divided into four management districts: Kamishak, Southern, Outer, and Eastern (Figure 1). Purse seine and set gillnet are the only legal commercial gear types for salmon. Entry into the commercial fishery has been limited since 1972. There were 71 seine and 20 set gill net permits fished during 1991.

Since 1961, catches of all five species of Pacific salmon have been documented in this area. In 1970 the Alaska Department of Fish and Game (ADF&G) began sampling sockeye *Oncorhynchus nerka* and chum salmon *O. keta* catches for age, sex, weight and length (AWL). AWL data between 1970 and 1986, and between 1988 and 1990, has been summarized by Schroeder (1984, 1985, 1986), Morrison (1987), and Yuen et al. (1989, 1990, 1991). There was no catch-sampling program in 1987. Aerial and ground escapement surveys of pink salmon *O. gorbuscha* began in 1960, chum salmon in 1964, and sockeye salmon in 1969. Annual escapement data are summarized in annual management reports for the Lower Cook Inlet Area (e.g., Bucher and Morrison 1991).

Historically, fishing for a single species within a bay or drainage lasts 3-6 weeks. Some sockeye fisheries began in June, and chum salmon fisheries began in July. Both ended in August (Table 1). Commercial fishing for chinook salmon *O. tshawytscha* has begun as early as May, and fishing for coho salmon *O. kisutch* has extended into September. Current management strategy has established fishing districts to allow for the management of discrete stocks. Commercial harvests are monitored so that predetermined escapement goals are met and the escapement is obtained from all run segments of a stock. Interception fisheries have been allowed to continue provided that harvests have not been detrimental to the individual contributing stocks.

The primary focus of the Lower Cook Inlet salmon catch-sampling program has been to collect sockeye and chum salmon AWL data from the purse seine fisheries that target discrete stocks. These single-stock fisheries normally account for about 97% of the total sockeye and chum catch from Lower Cook Inlet. The purse seine fisheries in the Halibut Cove, Halibut Cove Lagoon, Tutka Bay, and Douglas River areas, as well as the three set net fisheries in Lower Cook Inlet, were not sampled because they did not target specific local stocks. Chinook salmon samples were also not collected because the total chinook salmon harvest was expected to be <1% of the total salmon catch. The coho and pink salmon catches are normally not sampled because they are expected to exhibit no variation in their annual age compositions.

The objectives of the 1991 salmon catch-sampling program were to (1) estimate the age and size composition for the sockeye and chum salmon fisheries, and (2) obtain age and size composition statistics for the Chenik Lake sockeye escapement. This information is used to track changes in the sockeye age composition during the fishing season, allow fishery managers to respond inseason to the unexpected strengths or weaknesses of a particular age group, prepare a preseason forecast of abundance, and to evaluate escapement goals.

METHODS

The Lower Cook Inlet salmon harvest has been managed as 16 independent purse seine fisheries, most of which target on a discrete stock of sockeye or chum salmon, each with its own unique escapement goal. Nine sockeye and two chum salmon stocks were sampled in 1991. Each stock was considered to be a geographical sampling strata (Figures 2, 3).

Catch samples were obtained dockside when tenders were delivering catches from a single fishery. If tenders were expected to gather fish from several fisheries before returning to port, then samples were obtained on board a tender before the fish were put into the hold. The catch sampling crew interviewed the fishermen delivering fish to ascertain the origin of the catch before obtaining any samples. If samples were collected from fish removed from a tender hold, the skipper was interviewed to confirm that no fish from an earlier sampling period were present. Escapement samples were obtained from the Chenik Lake weir.

Fish were measured from mid-eye to the fork of the tail with a digital measuring board to an accuracy of $\pm$1.0 mm. Fish were weighed with a hand-held spring scale to the nearest 0.1 kg. Sex was determined from external secondary sexual characteristics.

Scales used to determine age were collected, when possible, from the *preferred* area of each salmon: approximately 3 rows above the lateral line and posterior of the dorsal fin. Scales were cleaned and mounted on gum cards sculptured side up, from which an acetate impression was made. Images of scales were magnified 35x, and the number of annuli per scale were counted to determine age.

The European age designation system was used where the first digit refers to the number of fresh water annuli, the second digit refers to the number of marine annuli, and the total age is the sum of the two digits plus one. For example, an age-1.2 fish is a 4-year-old fish that spent 2 years in fresh water (first winter spent in the gravel as an alevin) and 2 years at sea.

Sample sizes were set for each sampling strata to estimate age proportions, p_i, from a population of k age groups simultaneously within a specified distance, d, of their true population age proportions, π_i, 90% of the time (1 -α). That is,

$$Pr\left(\bigcap_{i=1}^{k} |p_1 - \pi_i| \le d\right) \ge 1 - \alpha \quad , \tag{1}$$

where the confidence levels d and α were chosen to be 0.05 and 0.10, respectively, $\alpha_i = 2(1 - \Phi(z_i))$, $\Sigma\alpha_i < \alpha$, $\Phi(z_i)$ = area under the standard normal distribution, and $z_i = d\sqrt{n_i} / \sqrt{(p_i(1-p_i))}$. Thompson (1987) calculated a maximum sample size of 403 for a worst-case scenario when three age groups were present

in equal numbers, where $d = 0.05$, and $\alpha = 0.10$. Any deviation in the number of age groups or unequal contributions by age group would require a smaller sample size.

Sample size n for mean weight of each sex was determined from the methods described by Snedecor and Cochran (1967), i.e.,

$$n = 4\frac{\sigma^2}{L^2} \quad , \tag{2}$$

where σ = population standard deviation, and L = allowable error, i.e., 0.1 kg.

Samples sizes for mean weights ranged between 5 and 50 depending on σ. Most sample sizes were around 20 for a 200-fish sample, or 1 in 10 fish, of each sex.

Estimates of standard errors by age group were derived according to the procedures for stratified random sampling described by Snedecor and Cochran (1967):

$$SE = \sqrt{\sum C_h^2 \frac{s_h^2}{n_h}} \quad , \tag{3}$$

where C_h^2 = the salmon catch in the hth stratum, and s_h^2 = the sample variance in the hth stratum.

Catch totals were obtained from harvest receipts, i.e., fish tickets, which document each sale by a licensed fishermen. Escapement indices obtained from aerial and ground surveys were expanded into total escapement estimates.

RESULTS

A total of 317,947 sockeye salmon were harvested in Lower Cook Inlet in 1991. The sockeye escapement was estimated to be 46,939 fish from aerial and ground surveys. Catch samples were collected from runs to Aialik Lake, Nuka Bay, Port Dick Bay, China Poot Bay, Chenik Lake, Douglas River, Mikfik Creek, and Kirschner Lake. The harvest of these stocks accounted for 67% of the total sockeye catch. The remaining sockeye catch was not sampled because either the runs were small, they did not represent any specific local stock, or they were the initial returns to a hatchery release of a known age.

A total of 12 sampling trips were made, including the extended period of sampling at Chenik weir. Eight samples met or exceeded the 95% confidence level. A total of 4,660 readable scales were collected. Individual sample sizes and dates are summarized in Table 2.

The total chum salmon harvest for Lower Cook Inlet was 24,232 fish, of which 1,962 were from the Southern District, 14,337 from the Outer District, 80 from the Eastern District, and 7,853 from the Kamishak District. The total chum escapement was 93,395 fish. Two very small samples of 63 and 68 specimens were obtained from Kamishak River and Bruin Bay in the Kamishak District (Table 2). These two fisheries represent about 5% of the total chum salmon catch.

Eastern District Sockeye Salmon

In the Eastern District only Aialik Lagoon was opened for sockeye salmon purse seining. The total sockeye harvest from Aialik Bay was 4,703 fish. The total run was approximately 8,403 salmon and the escapement was 4,448. One catch sample collected on 7 July was composed of age groups 1.2, 1.3, 2.2, and 2.3. There were more females than males in the sample. These fish, from the Gulf of Alaska side of the Kenai Peninsula, tend to be larger than other Lower Cook Inlet sockeye salmon; their average mean weight was 2.43 kg (Table 3).

Outer District Sockeye Salmon

In the Outer District sockeye harvests totaled 1,773 fish in Nuka Bay and 4,561 in Port Dick. In addition, 6 fish were caught in Port Chatham, 12 in Windy Bay, and 56 near Nuka Island. The harvests in Nuka Bay were from natural runs of sockeye salmon. Escapements in Nuka Bay were 1 fish in James Lagoon, an estimated 8,200 in Desire lake, 4,075 in Delight Lake, and 300 in Delectable or Ecstasy Lake, a newly formed lake with two names. The Port Dick enhanced run was the result of a lake stocking project in 1987. Although a catch was reported in Port Chatham, there is no natural run of sockeye salmon in Port Chatham.

A catch sample was collected from Nuka Bay on 26 June. The predominant age groups were 1.2, 1.3, 2.2, and 2.3. The Nuka Bay sockeye salmon, also from the Gulf of Alaska side of the Kenai Peninsula, tend to be larger than other Lower Cook Inlet sockeye salmon. In 1991, their sampled mean weight was 2.00 kg. Over 59% of the sample was female (Table 4).

A catch sample was obtained from Port Dick on 22 July. There were slightly more males, 51.76%, than females (Table 5). The sample was composed of age-1.3 and -2.2 returns from an outmigration of age-1 smolts in 1988 and age-2 smolts in 1989 from a lake stocking of age-0 fry in 1987; and age-1.2 and -2.1 returns from an outmigration of age-1 smolts in 1989 and age-2 smolts in 1990 from a lake stocking of age-0 fry in 1988.

Southern District Sockeye Salmon

The total commercial sockeye salmon harvest in the Southern District was 170,224. The only fishery targeting on a discrete stock in the Southern District was at China Poot Bay. The run to China Poot Bay, i.e. Leisure Lake, supported the largest sockeye fishery in Lower Cook Inlet in 1990 and was the result of an ongoing lake stocking program that began in 1976.

Within China Poot Bay the commercial fishery harvest was 88,933 fish, and the hatchery cost recovery harvest was 7,105. Mean weights reported on fish tickets were 1.80 and 1.77 kg, respectively. In the commercial catch samples, mean weight was 1.69 kg, age groups 1.2, 1.3, and 2.2 were common, and males were 55.42% (Table 6). The total sport catch was 500 fish and the personal use catch 4,500 (Holland and McKean 1991). Because this lake does not provide access to returning sockeye salmon, the management strategy was to harvest all sockeye salmon in this terminal fishery. In 1991, however, about 320 late arriving sockeye salmon were not harvested.

Adjacent to China Poot Bay other purse seine fisheries reported mixed stock sockeye catches of 4,726 fish in Halibut Cove Lagoon (mean weight = 2.00 kg), 27,045 in Halibut Cove (1.90 kg), 1,198 in Tutka Bay-Sadie Cove (1.84 kg; including 34 caught as part of the Tutka Hatchery pink salmon cost recovery), and 20,692 in Neptune Bay (1.76 kg). The mixed stock sockeye salmon caught in Neptune Bay were thought to include the initial returns from a hatchery release in Hazel Lake.

Set gillnet fisheries also reported mixed stock sockeye harvests of 4,241 fish in Halibut Cove (mean weight = 2.20 kg), 6,398 in Barabara Creek (2.41 kg), 5,875 in Kasitsna Bay (2.42 kg), and 4,011 in Seldovia Bay (2.37 kg). Sockeye caught in the set net fisheries may be destined for Upper Cook Inlet because their mean weights are larger than those reported from China Poot Bay.

The only sizable escapement of sockeye salmon was 7,000 fish reported in English Bay. No commercial fishing was allowed on the English Bay stocks in 1991.

Kamishak District Sockeye Salmon

The harvest of local sockeye salmon stocks in the Kamishak District numbered 42,654 fish in the Kirschner Lake area, 13,234 from the Bruin Bay area, 60,397 from Chenik Lake (of which 8,624 were for hatchery cost recovery), 409 from Paint River, 12,886 from Mikfik Creek, 775 from the Kamishak River area, and 6,257 from the Douglas River area. Escapements were 10 fish in Ursus Cove, 100 in Bruin Bay, 1,900 in Amakdedori Creek, 10,189 in Chenik Lake, 9,700 in Mikfik Creek, 650 in Big Kamishak River, and 75 in Douglas Beach River. In addition, 291 sockeye salmon were reported unharvested in the Paint River where fish migration into fresh water is prevented by a waterfall.

Chenik Lake's natural run has been supplemented with hatchery reared sockeye juveniles as early as 1978. A catch sample was obtained from the Chenik run on 1 July. Two age groups, 1.2 and 1.3, equally dominated the Chenik catch. There were slightly more males (51.16%) than females (Table 7). Escapement samples were obtained from the Chenik Lake weir between 15 and 25 July. There were twice an many age-1.2 as there were age-1.3 in the escapement samples. Although the mean length of the escapement sample were similar to the catch, the escapement mean weight (1.74 kg) was greater than the catch (1.45 kg; Table 8).

A catch sample was obtained from the Douglas River harvest on 3 July. Three age groups, 0.3, 1.2 and 1.3, dominated the samples. There were slightly more females (54.23%) than males (Table 9). A catch sample from the Mikfik run was collected on 11 June. Age groups 1.2, 1.3, and 2.2 dominated the sample. The mean weight was 1.56 kg, and there were more females (54.82%) than males (Table 10).

Kirschner Lake was first stocked age-0 fry in 1987. These juveniles migrated to sea as age-1 smolt in 1988 and age-2 smolt in 1989 and would have returned in 1991 as age-1.3 and -2.2 adults. The second stocking in 1988 would have produced age-1.2 and -2.1 adults returning in 1991. The age-1.4 and 2.3 adults found the in samples were most likely fish from another system intercepted in the Kirschner fishery. A catch sample from Kirschner was obtained on 18 July. Males made up 60.23% of the samples; the mean weight was 1.79 kg (Table 11).

Kamishak District Chum Salmon

A very small catch sample was obtained from the Kamishak River harvest on 3 July. There were three age groups in the sample, 0.3, 0.4 and 0.5. There were more females (65.10%) than males (Table 12). A small catch sample was also obtained from Bruin Bay on 18 July. Age groups 0.3 and 0.4 dominated the sample. There were also more females (55.98%) than males, the mean weight was 3.72 kg (Table 13).

DISCUSSION

A historical summary of mean lengths, weights, and age composition by brood year and age group is presented in the Appendix for those fisheries in this report having at least 2 years of catch sampling data. Mean lengths and weights should increase with ocean age but may vary among brood years. For example, male sockeye salmon from Aialik aged 1.1, 1.2, and 1.3 from brood year 1980 exhibited mean lengths progressing from 356 to 516 and to 570 mm. Similarly, those fish from the 1981 brood year had mean lengths that increased from 401 to 501 and to 567 mm (Appendix A).

In the few cases when this trend did not occur, the data were examined for key punch errors, and scales were reaged as required. The Appendix reflects all revisions and, therefore, supersedes all data reported in earlier reports. There remain a few instances where mean length or weight do not increase with age, and in which either the original data sheets or the scale gum cards (or acetate cards) could not be retrieved for verification and reaging. For example, female sockeye salmon from Aialik aged 1.3 and 1.4 from the 1978 brood year appeared to have diminished in size from 558 to 547 mm (Appendix A). The most likely error is in the age-1.4 females from the 1984 catch sample which may have been age-1.3 incorrectly aged as 1.4; in three other occurrences of age 1.4 fish sampled in Aialik, both males and females had mean lengths > 600 mm. We are currently searching for the original data forms and scales cards to verify the possibility.

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Table 1. Daily catch of sockeye salmon in 10 Lower Cook Inlet fisheries, 1991.

Month	Day	Sockeye Salmon								Chum Salmon		
		Aialik Bay	Nuka Bay	Pt. Dick	China Poot Bay	Chenik	Douglas R.	Mikfik C.	Kirschner	Kamishak R.	Bruin B.	
Jun	7 Fri							2,492				2,492
	10 Mon							6,824				6,824
	11 Tue							3,217				3,217
	17 Mon		33									33
	20 Thu		161									161
	21 Fri		46									46
	22 Sat		15									15
	23 Sun					110						110
	24 Mon		298		107							405
	25 Tue		318		50							368
	26 Wed		25		190	9						224
	27 Thu		329		273	529	1,180	106				2,417
	28 Fri		303		214	383	3,005	213				4,118
	29 Sat					21		29				50
Jul	1 Mon	5	33		2,007	557	1,042					3,644
	2 Tue		170		1,405	1,048	514	3		97		3,237
	3 Wed				1,373	4,282						5,655
	4 Thu				2,924	2,441	513	2	984	605		7,469
	5 Fri				620	2,649			183			3,452
	6 Sat	3,275			415	1,060						4,750
	8 Mon	97			5,085	9,600			2,446			17,228
	9 Tue	29			3,182	2,284			89			5,584
	10 Wed				2,951	3,081			2,339			8,371
	11 Thu	11			206	2,289			3,902			6,408
	12 Fri	24				2,573			705			3,302
	15 Mon	16	10		11,794						25	11,845
	16 Tue		7		10,485						55	10,547
	17 Wed				7,974						41	8,015
	18 Thu	9	25		10,017				2,980			13,031
	19 Fri	3			7,857				3,954			11,814
	20 Sat				191				499			690
	21 Sun				182							182
	22 Mon	37		3,264	8,641				10,354			22,296
	23 Tue	78			2,085							2,163
	24 Wed	975			1,632						6	2,613
	25 Thu			431	927	11,273			2,056			14,687
	26 Fri			34	1,963	1,220			2,841			6,058

-continued-

Table 1. (page 2 of 2)

Month	Day	Sockeye Salmon								Chum Salmon		
		Aialik Bay	Nuka Bay	Pt. Dick	China Poot Bay	Chenik	Douglas R.	Mikfik C.	Kirschner	Kamishak R.	Bruin B.	
Jul	27 Sat				50	210			33			293
	28 Sun				194							194
	29 Mon			30	1,941	2,595			4,602		178	9,346
	30 Tue			12	827	626			11			1,476
	31 Wed				431	957			1,369			2,757
Aug	1 Thu			5	378	292			912			1,587
	2 Fri			5	341	184			456			986
	3 Sat			282								282
	4 Sun			197								197
	5 Mon			107	21	697						825
	6 Tue	3		38		576			1,859			2,476
	7 Wed	17		32		140			2		28	219
	8 Thu	10		26		87					36	159
	9 Fri	6		12								18
	10 Sat			17								17
	11 Sun	3		20							29	52
	12 Mon	21		17								38
	13 Tue	4		8					78		20	110
	14 Wed	10		6								16
	15 Thu	15		1								16
	16 Fri			7								7
	17 Sat			9								9
	18 Sun			1								1
	19 Mon	26										26
	20 Tue	18										18
	21 Wed						3					3
	23 Fri	11										11
Total		4,703	1,773	4,561	88,933	51,773	6,257	12,886	42,654	702	418	214,660

Table 2. Sample sizes of readable salmon scales and corresponding simultaneous confidence levels for age composition in Lower Cook Inlet, 1991.

Species	Fishery	Sample Dates	Sample Size	Simultaneous Confidence Level
Sockeye	Aialik	7/7	475	.960
	Nuka	6/26	476	.955
	Port Dick	7/22	481	.946
	China Poot	7/13	485	.949
		7/18	354	.889
	Chenik	7/1	518	.955
	Chenik weir	7/15-25	492	.957
	Douglas River	7/3	201	.741
	Mikfik	6/11	529	.975
	Kirschner	7/18	518	.962
Chum	Kamishak	7/3	63	.001
	Bruin Bay	7/18	68	.224

Table 3. Age, sex, length (mm), and weight (kg) of sockeye salmon commercial catch from Aialik Bay, 1991.

	Age Group				
	1.2	1.3	2.2	2.3	Total
Sample period:	7 July				
Males	287	376	218	1,020	1,901
Percent	6.10	7.99	4.64	21.69	40.42
Sample Size	29	38	22	103	192
Mean Length	496	566	498	571	550
Std. Error	8	4	7	3	2
Sample Size	29	38	22	103	192
Mean Weight	2.10	2.96	2.11	2.86	2.68
Std. Error	0.22	0.13	0.18	0.08	0.06
Sample Size	6	5	3	17	31
Females	287	673	366	1,476	2,802
Percent	6.10	14.31	7.78	31.38	59.58
Sample Size	29	68	37	149	283
Mean Length	496	544	501	547	535
Std. Error	5	3	4	2	1
Sample Size	29	68	37	149	283
Mean Weight	1.76	2.42	1.96	2.37	2.27
Std. Error	0.08	0.09	0.14	0.05	0.04
Sample Size	5	11	5	25	46
Both Sexes	574	1,049	584	2,496	4,703
Percent	12.20	22.30	12.42	53.07	100.00
Sample Size	58	106	59	252	475
Mean Length	496	552	500	557	541
Std. Error	5	2	4	2	1
Sample Size	58	106	59	252	475
Mean Weight	1.93	2.61	2.02	2.57	2.43
Std. Error	0.12	0.07	0.11	0.04	0.03
Sample Size	11	16	8	42	77

Table 4. Age, sex, length (mm), and weight (kg) of sockeye salmon commercial catch from Nuka Bay, 1991.

	Age Group							
	1.2	1.3	2.2	1.4	2.3	3.2	3.3	Total
Sample period:	26 June							
Males	56	358	82		216	4	7	723
Percent	3.16	20.19	4.62		12.18	0.23	0.39	40.78
Sample Size	15	96	22		58	1	2	194
Mean Length	504	579	516		574	538	581	564
Std. Error	6	3	6		3		4	2
Sample Size	15	96	22		58	1	2	194
Mean Weight	1.61	2.35	1.76		2.33	2.11	2.48	2.22
Std. Error	0.27	0.16	0.04		0.24			0.11
Sample Size	2	14	5		4	1	1	27
Females	112	494	142	4	279	4	15	1,050
Percent	6.32	27.86	8.01	0.23	15.74	0.23	0.85	59.22
Sample Size	30	133	38	1	75	1	4	282
Mean Length	491	555	495	585	553	517	551	540
Std. Error	4	3	4		3		9	2
Sample Size	30	133	38	1	75	1	4	282
Mean Weight	1.43	1.99	1.37		1.99		2.24	1.85
Std. Error	0.08	0.05	0.10		0.08			0.04
Sample Size	7	27	5		16		1	56
Both Sexes	168	852	224	4	495	8	22	1,773
Percent	9.48	48.05	12.63	0.23	27.92	0.45	1.24	100.00
Sample Size	45	229	60	1	133	2	6	476
Mean Length	495	565	503	585	562	528	560	550
Std. Error	3	2	3		2		6	1
Sample Size	45	229	60	1	133	2	6	476
Mean Weight	1.49	2.14	1.51		2.14	2.11	2.32	2.00
Std. Error	0.10	0.07	0.06		0.11			0.05
Sample Size	9	41	10		20	1	2	83

Table 5. Age, sex, and length (mm) of sockeye salmon commercial catch from Port Dick Bay, 1991.

	Age Group				
	1.2	2.1	1.3	2.2	Total
Sample period:	22 July				
Males	929	9	256	1,167	2,361
Percent	20.37	0.20	5.61	25.59	51.76
Sample Size	98	1	27	123	249
Mean Length	479	330	520	478	482
Std. Error	2		5	2	1
Sample Size	98	1	27	123	249
Females	844		389	967	2,200
Percent	18.50		8.53	21.20	48.24
Sample Size	89		41	102	232
Mean Length	474		516	482	485
Std. Error	2		4	2	1
Sample Size	89		41	102	232
Both Sexes	1,773	9	645	2,134	4,561
Percent	38.87	0.20	14.14	46.79	100.00
Sample Size	187	1	68	225	481
Mean Length	476	330	517	480	483
Std. Error	2		3	1	1
Sample Size	187	1	68	225	481

Table 6. Age, sex, length (mm), and weight (kg) of sockeye salmon commercial catch from China Poot Bay, 1991.

	Age Group						
	1.2	2.1	1.3	2.2	2.3	3.2	Total
Sample Period 1: 13 July							
Males	7,015	260	606	4,850	130		12,861
Percent	33.40	1.24	2.89	23.09	0.62		61.24
Sample Size	162	6	14	112	3		297
Mean Length	481	364	521	484	515		482
Std. Error	2	7	7	2	15		1
Sample Size	162	6	14	112	3		297
Mean Weight	1.79		2.35	1.79	2.10		1.82
Std. Error	0.09		0.15	0.07			0.06
Sample Size	15		2	15	1		33
Females	4,200		520	3,378	43		8,141
Percent	20.00		2.48	16.08	0.20		38.76
Sample Size	97		12	78	1		188
Mean Length	479		531	481	532		483
Std. Error	3		7	2			2
Sample Size	97		12	78	1		188
Mean Weight	1.68			1.77			1.72
Std. Error	0.07			0.06			0.05
Sample Size	12			10			22
Both Sexes	11,215	260	1,126	8,228	173		21,002
Percent	53.40	1.24	5.36	39.18	0.82		100.00
Sample Size	259	6	26	190	4		485
Mean Length	480	364	526	483	519		482
Std. Error	1	7	5	2	15		1
Sample Size	259	6	26	190	4		485
Mean Weight	1.75		2.35	1.78	2.10		1.78
Std. Error	0.06		0.15	0.05			0.04
Sample Size	27		2	25	1		55

-Continued-

Table 6. (page 2 of 3)

	Age Group						
	1.2	2.1	1.3	2.2	2.3	3.2	Total
Sample Period 2: 18 July							
Males	18,613	192	1,535	11,322	192	384	32,238
Percent	27.40	0.28	2.26	16.67	0.28	0.57	47.46
Sample Size	97	1	8	59	1	2	168
Mean Length	477	351	526	485	581	437	482
Std. Error	2		16	3		22	2
Sample Size	97	1	8	59	1	2	168
Mean Weight	1.65	0.50	2.50	1.80			1.74
Std. Error	0.06			0.12			0.06
Sample Size	8	1	1	8			18
Females	18,422		2,495	14,008	576	192	35,693
Percent	27.12		3.67	20.62	0.85	0.28	52.54
Sample Size	96		13	73	3	1	186
Mean Length	477		533	477	551	486	482
Std. Error	2		8	2	23		2
Sample Size	96		13	73	3	1	186
Mean Weight	1.54		2.10	1.60			1.60
Std. Error	0.04		0.30	0.11			0.05
Sample Size	10		2	6			18
Both Sexes	37,035	192	4,030	25,330	768	576	67,931
Percent	54.52	0.28	5.93	37.29	1.13	0.85	100.00
Sample Size	193	1	21	132	4	3	354
Mean Length	477	351	530	481	559	453	482
Std. Error	1		8	2	23	22	1
Sample Size	193	1	21	132	4	3	354
Mean Weight	1.60	0.50	2.25	1.69			1.67
Std. Error	0.04		0.30	0.08			0.04
Sample Size	18	1	3	14			36

-Continued-

Table 6. (page 3 of 3)

	Age Group						
	1.2	2.1	1.3	2.2	2.3	3.2	Total
All Periods Combined:							
Males	25,628	452	2,141	16,172	322	384	45,099
Percent	28.82	0.51	2.41	18.18	0.36	0.43	50.71
Sample Size	259	7	22	171	4	2	465
Mean Length	478	359	524	485	554	437	482
Std. Error	2	7	12	2	15	22	1
Sample Size	259	7	22	171	4	2	465
Mean Weight	1.69	0.50	2.46	1.80	2.10		1.76
Std. Error	0.05		0.15	0.09			0.04
Sample Size	23	1	3	23	1		51
Females	22,622		3,015	17,386	619	192	43,834
Percent	25.44		3.39	19.55	0.70	0.22	49.29
Sample Size	193		25	151	4	1	374
Mean Length	477		533	478	550	486	482
Std. Error	2		7	2	23		1
Sample Size	193		25	151	4	1	374
Mean Weight	1.57		2.10	1.63			1.62
Std. Error	0.04		0.30	0.09			0.04
Sample Size	22		2	16			40
Both Sexes	48,250	452	5,156	33,558	941	576	88,933
Percent	54.25	0.51	5.80	37.73	1.06	0.65	100.00
Sample Size	452	7	47	322	8	3	839
Mean Length	478	359	529	481	551	453	482
Std. Error	1	7	6	1	19	22	1
Sample Size	452	7	47	322	8	3	839
Mean Weight	1.63	0.50	2.27	1.71	2.10		1.69
Std. Error	0.03		0.24	0.06			0.03
Sample Size	45	1	5	39	1		91

Table 7. Age, sex, length (mm), and weight (kg) of sockeye salmon commercial catch from Chenik, 1991.

	Age Group				
	1.2	1.3	2.2	2.3	Total
Sample period:	1 July				
Males	14,192	10,395	999	900	26,486
Percent	27.41	20.08	1.93	1.74	51.16
Sample Size	142	104	10	9	265
Mean Length	505	550	517	562	525
Std. Error	2	2	9	5	1
Sample Size	142	104	10	9	265
Mean Weight	1.40	1.71	1.59	1.99	1.55
Std. Error	0.04	0.05	0.03	0.06	0.03
Sample Size	26	21	3	3	53
Females	9,395	14,792	800	300	25,287
Percent	18.15	28.57	1.55	0.58	48.84
Sample Size	94	148	8	3	253
Mean Length	481	530	492	512	510
Std. Error	2	2	10	7	1
Sample Size	94	148	8	3	253
Mean Weight	1.10	1.50	1.38		1.35
Std. Error	0.04	0.03			0.02
Sample Size	14	24	1		39
Both Sexes	23,587	25,187	1,799	1,200	51,773
Percent	45.56	48.65	3.47	2.32	100.00
Sample Size	236	252	18	12	518
Mean Length	495	538	506	550	518
Std. Error	1	2	7	4	1
Sample Size	236	252	18	12	518
Mean Weight	1.28	1.59	1.50	1.99	1.45
Std. Error	0.03	0.03	0.03	0.06	0.02
Sample Size	40	45	4	3	92

Table 8. Age, sex, length (mm), and weight (kg) of sockeye salmon escapement by Chenik Lake weir, 1991.

	Age Group					
	0.2	1.2	1.3	2.2	2.3	Total
Sample period:	15 - 25 July					
Males	21	3,416	2,071	21	21	5,550
Percent	0.21	33.53	20.33	0.21	0.21	54.47
Sample Size	1	165	100	1	1	268
Mean Length	550	506	558	520	600	526
Std. Error		2	3			2
Sample Size	1	165	100	1	1	268
Mean Weight		1.67	2.19			1.87
Std. Error		0.05	0.08			0.04
Sample Size		28	14			42
Females		2,962	1,615	62		4,639
Percent		29.07	15.85	0.61		45.53
Sample Size		143	78	3		224
Mean Length		480	520	463		494
Std. Error		2	3	9		2
Sample Size		143	78	3		224
Mean Weight		1.43	1.90	1.81		1.60
Std. Error		0.07	0.08			0.05
Sample Size		30	11	1		42
Both Sexes	21	6,378	3,686	83	21	10,189
Percent	0.21	62.60	36.18	0.81	0.21	100.00
Sample Size	1	308	178	4	1	492
Mean Length	550	494	541	478	600	511
Std. Error		1	2	9		1
Sample Size	1	308	178	4	1	492
Mean Weight		1.56	2.06	1.81		1.74
Std. Error		0.04	0.06			0.03
Sample Size		58	25	1		84

Table 9. Age, sex, and length (mm) of sockeye salmon commercial catch from Douglas River, 1991.

	Age Group						
	0.2	0.3	1.2	1.3	2.2	2.3	Total
Sample period:	3 July						
Males		187	934	1,494	187	62	2,864
Percent		2.99	14.93	23.88	2.99	0.99	45.77
Sample Size		6	30	48	6	2	92
Mean Length		581	484	565	512	574	536
Std. Error		12	8	4	27	4	4
Sample Size		6	30	48	6	2	92
Females	62	498	436	2,210	62	125	3,393
Percent	0.99	7.96	6.97	35.32	0.99	2.00	54.23
Sample Size	2	16	14	71	2	4	109
Mean Length	485	540	485	541	532	547	532
Std. Error	4	4	7	2	19	15	2
Sample Size	2	16	14	71	2	4	109
Both Sexes	62	685	1,370	3,704	249	187	6,257
Percent	0.99	10.95	21.90	59.20	3.98	2.99	100.00
Sample Size	2	22	44	119	8	6	201
Mean Length	485	551	484	551	517	556	534
Std. Error	4	4	6	2	21	10	2
Sample Size	2	22	44	119	8	6	201

Table 10. Age, sex, length (mm), and weight (kg) of sockeye salmon commercial catch from Mikfik Creek, 1991.

	Age Group				
	1.2	1.3	2.2	2.3	Total
Sample period:	11 June				
Males	853	3,897	950	122	5,822
Percent	6.62	30.24	7.37	0.95	45.18
Sample Size	35	160	39	5	239
Mean Length	464	500	456	501	488
Std. Error	4	2	3	8	1
Sample Size	35	160	39	5	239
Mean Weight	1.51	1.73	1.21	1.64	1.61
Std. Error	0.07	0.04	0.14	0.11	0.04
Sample Size	7	30	3	2	42
Females	1,413	3,776	1,583	292	7,064
Percent	10.97	29.30	12.28	2.27	54.82
Sample Size	58	155	65	12	290
Mean Length	461	499	457	494	482
Std. Error	3	2	3	6	1
Sample Size	58	155	65	12	290
Mean Weight	1.45	1.62	1.31	1.60	1.52
Std. Error	0.04	0.03	0.05	0.01	0.02
Sample Size	8	34	12	3	57
Both Sexes	2,266	7,673	2,533	414	12,886
Percent	17.58	59.55	19.66	3.21	100.00
Sample Size	93	315	104	17	529
Mean Length	462	499	456	496	484
Std. Error	2	1	2	5	1
Sample Size	93	315	104	17	529
Mean Weight	1.47	1.68	1.27	1.61	1.56
Std. Error	0.04	0.02	0.06	0.03	0.02
Sample Size	15	64	15	5	99

Table 11. Age, sex, length (mm), and weight (kg) of sockeye salmon commercial catch from Kirschner, 1991.

	Age Group						
	1.2	2.1	1.3	2.2	1.4	2.3	Total
Sample period:	18 July						
Males	9,058	494	2,059	13,915		165	25,691
Percent	21.24	1.16	4.83	32.62		0.39	60.23
Sample Size	110	6	25	169		2	312
Mean Length	475	350	517	479		503	478
Std. Error	2	4	6	2		27	1
Sample Size	110	6	25	169		2	312
Mean Weight	1.87	0.70	2.33	1.82			1.86
Std. Error	0.13		0.26	0.05			0.06
Sample Size	9	1	4	15			29
Females	5,188		1,647	9,964	82	82	16,963
Percent	12.16		3.86	23.36	0.19	0.19	39.77
Sample Size	63		20	121	1	1	206
Mean Length	471		516	480	529	535	482
Std. Error	3		4	2			1
Sample Size	63		20	121	1	1	206
Mean Weight	1.71			1.64		2.40	1.67
Std. Error	0.07			0.08			0.06
Sample Size	9			10		1	20
Both Sexes	14,246	494	3,706	23,879	82	247	42,654
Percent	33.40	1.16	8.69	55.98	0.19	0.58	100.00
Sample Size	173	6	45	290	1	3	518
Mean Length	474	350	517	480	529	513	480
Std. Error	2	4	4	1		27	1
Sample Size	173	6	45	290	1	3	518
Mean Weight	1.81	0.70	2.33	1.74		2.40	1.79
Std. Error	0.08		0.26	0.04			0.04
Sample Size	18	1	4	25		1	49

Table 12. Age, sex, and length (mm) of chum salmon commercial catch from Kamishak River, 1991.

	Age Group			
	0.3	0.4	0.5	Total
Sample period:	3 July			
Males	78	100	67	245
Percent	11.11	14.25	9.54	34.90
Sample Size	7	9	6	22
Mean Length	619	658	672	649
Std. Error	11	8	15	6
Sample Size	7	9	6	22
Females	201	234	22	457
Percent	28.63	33.33	3.13	65.10
Sample Size	18	21	2	41
Mean Length	603	630	642	619
Std. Error	7	6	8	4
Sample Size	18	21	2	41
Both Sexes	279	334	89	702
Percent	39.74	47.58	12.68	100.00
Sample Size	25	30	8	63
Mean Length	607	638	664	629
Std. Error	6	5	11	3
Sample Size	25	30	8	63

Table 13. Age, sex, length (mm), and weight (kg) of chum salmon commercial catch from Bruin Bay, 1991.

	Age Group				
	0.2	0.3	0.4	0.5	Total
Sample period:	18 July				
Males		135	49		184
Percent		32.30	11.72		44.02
Sample Size		22	8		30
Mean Length		572	624		586
Std. Error		6	10		5
Sample Size		22	8		30
Mean Weight		3.53	5.03		3.93
Std. Error		0.17	0.29		0.15
Sample Size		12	3		15
Females	6	130	92	6	234
Percent	1.44	31.10	22.01	1.44	55.98
Sample Size	1	21	15	1	38
Mean Length	469	574	607	646	586
Std. Error		4	10		5
Sample Size	1	21	15	1	38
Mean Weight	1.80	3.22	4.11	4.10	3.56
Std. Error		0.12	0.27		0.12
Sample Size	1	15	8	1	25
Both Sexes	6	265	141	6	418
Percent	1.44	63.40	33.73	1.44	100.00
Sample Size	1	43	23	1	68
Mean Length	469	573	613	646	586
Std. Error		4	7		3
Sample Size	1	43	23	1	68
Mean Weight	1.80	3.38	4.43	4.10	3.72
Std. Error		0.11	0.20		0.10
Sample Size	1	27	11	1	40

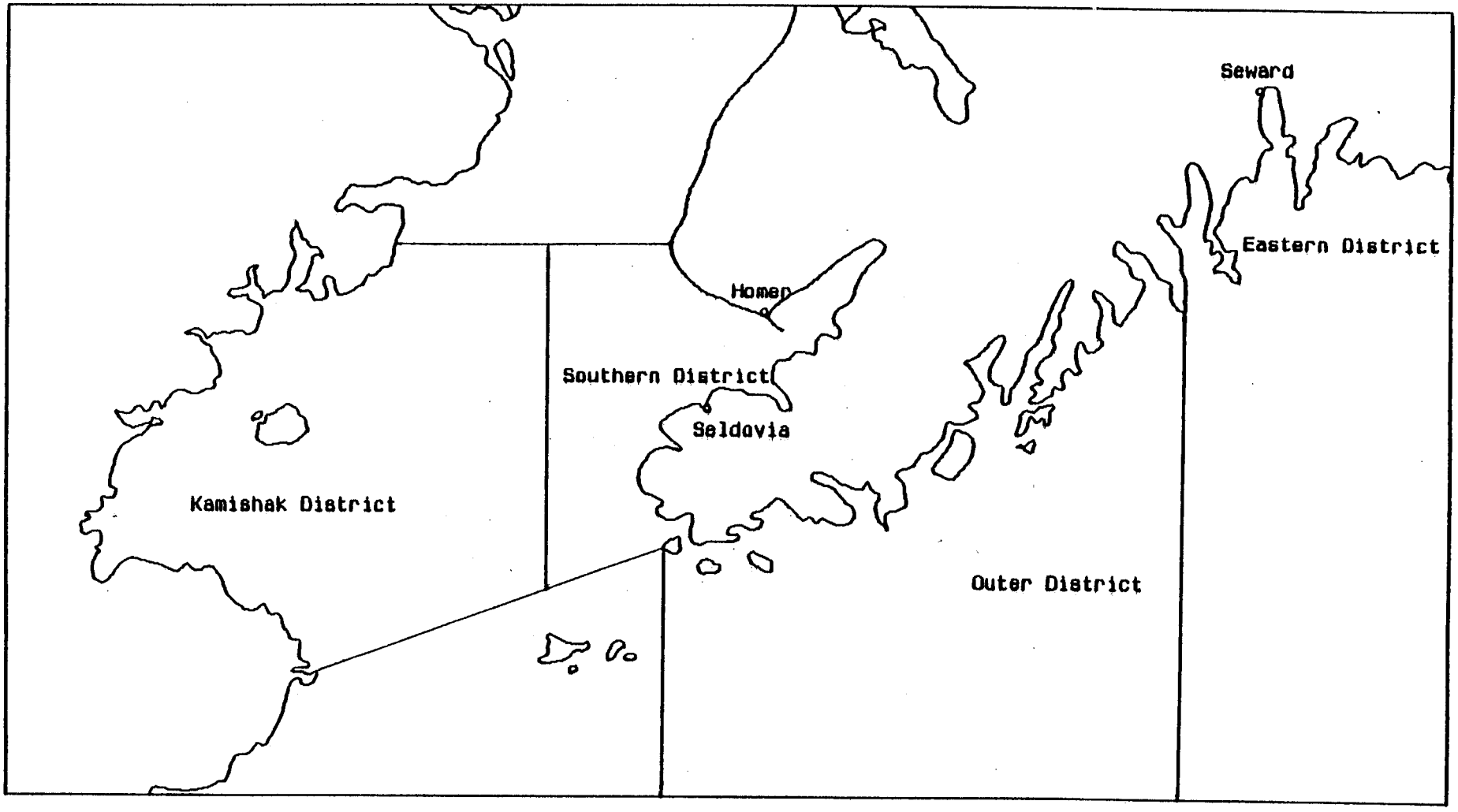

Figure 1. Kamishak, Southern, Outer, and Eastern Districts of Lower Cook Inlet Management Area.

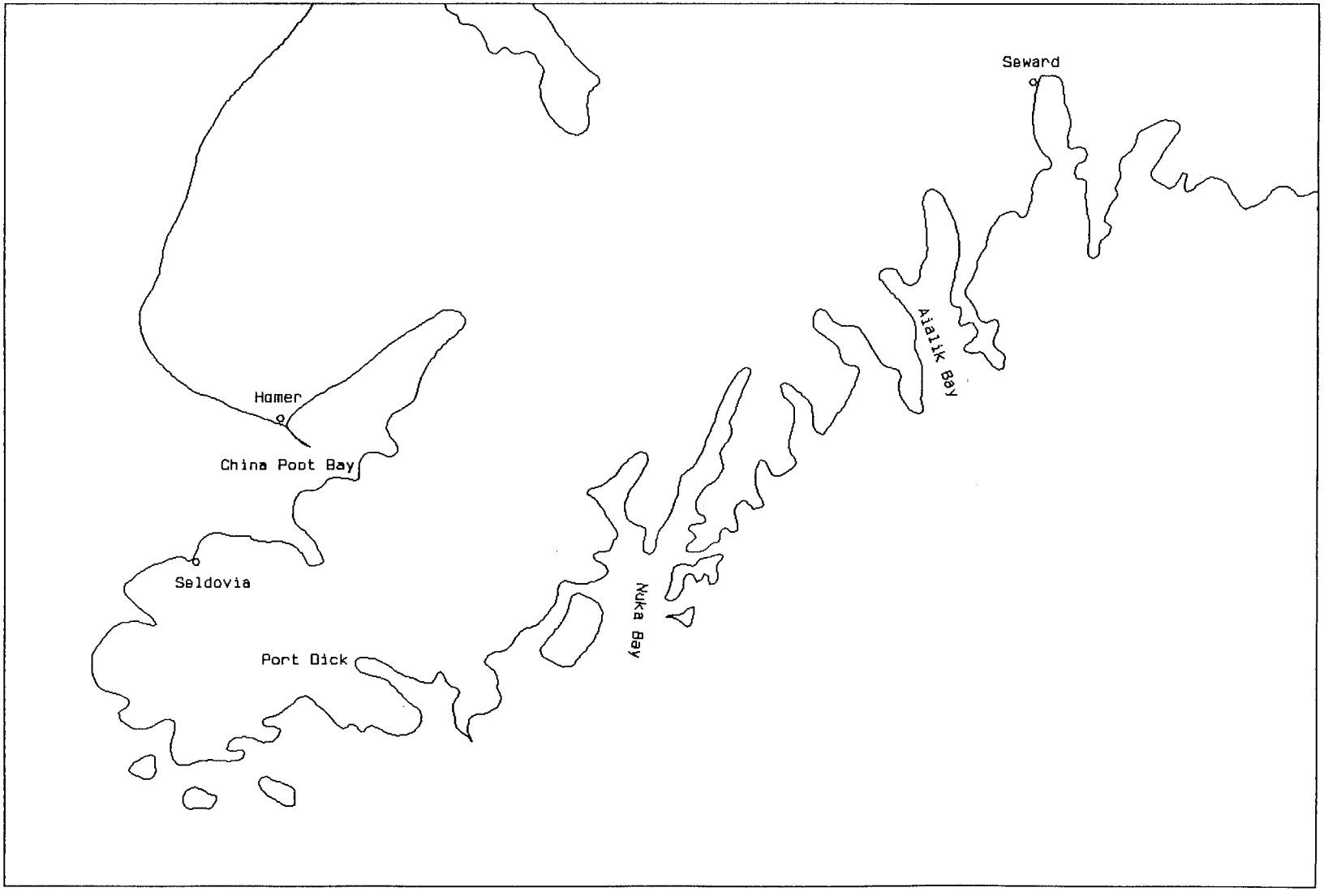

Figure 2. Salmon catch sampling sites in the Southern, Outer, and Eastern Districts, 1991.

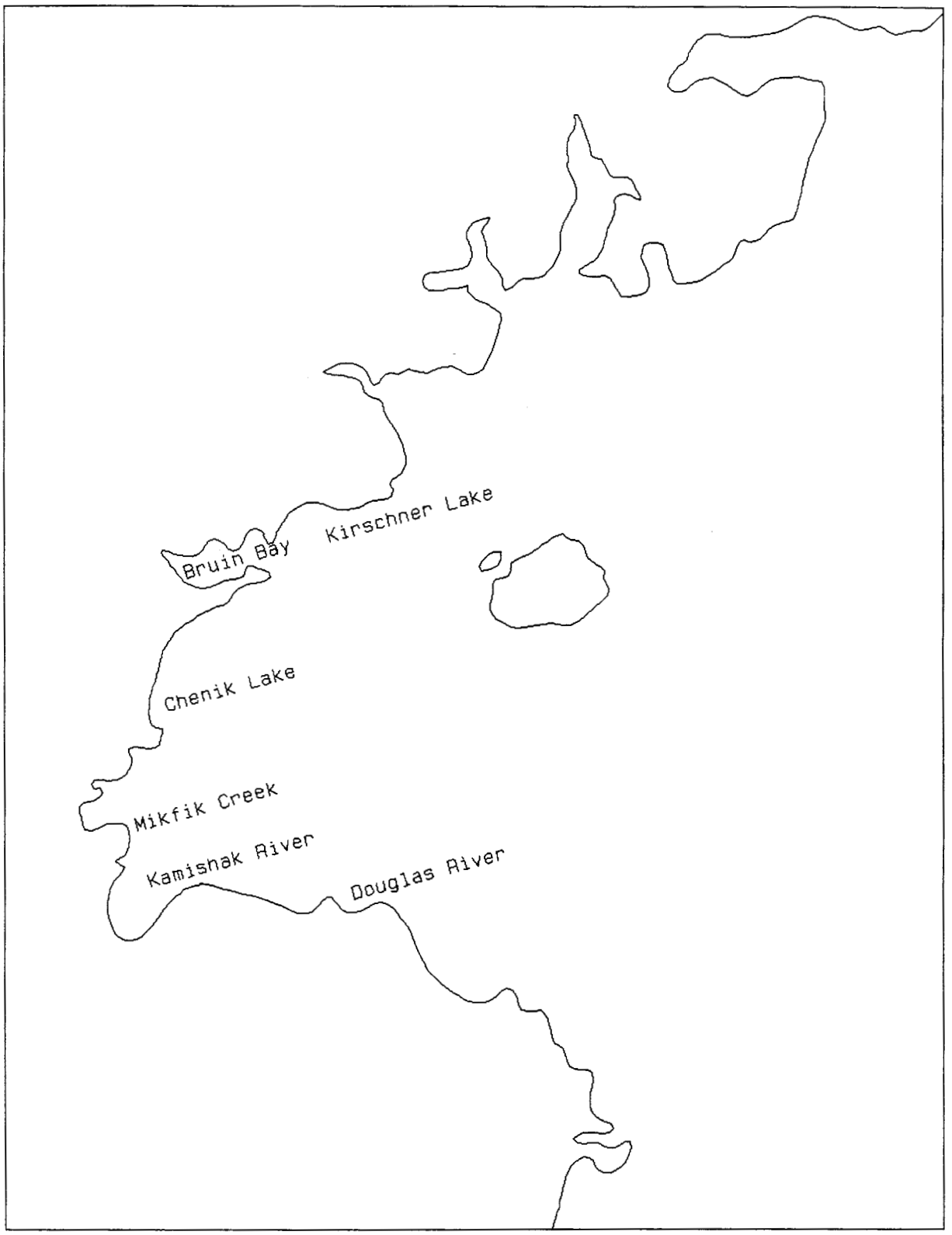

Figure 3. Salmon catch sampling sites in the Kamishak District, 1991.

APPENDIX

Appendix A. Aialik sockeye salmon mean length (mm), weight (kg), and age by brood year and age group.

Brood Year	Age Group[a] 0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4
Male Mean Length															
1978						582			535	587					
1979					503	582	649		530	583					
1980				356	516	570			511	572					
1981				401	501	567		381	499						
1982					497					582					
1983						581			513	608					
1984			562		517	591	610		540	610					
1985					522	613			545	572					
1986		660		368	542	567			498						
1987	479				497										
Female Mean Length															
1978						558	547		531	566					
1979					500	558			513	549					
1980					494	552			494	548					
1981		540			498	545			502						
1982					497					564					
1983						556			506	579					
1984		517			503	564	633		527	594					
1985					506	579			521	548					
1986					529	544			501						
1987					496										
Male Mean Weight															
1978						3.16			2.67	2.90					
1979					2.31	3.34	4.80		2.37	3.76					
1980					2.42	3.50			2.56	2.86					
1981					2.63	2.96		1.30	2.11						
1982					2.10					3.76					
1983						3.37			1.55	3.45					
1984					2.44	3.80			2.45	3.10					
1985					1.59	3.69			2.61	2.86					
1986				0.80	2.48	2.96			2.11						
1987					2.10										
Female Mean Weight															
1978						2.94	2.58		2.55	3.00					
1979					2.03	2.93			2.33	3.20					
1980					2.01	3.04			2.66						
1981		2.95			2.28										
1982										3.40					
1983						2.91			2.20	2.95					
1984					1.88	2.99			1.80	3.10					
1985					1.97	3.10			2.02	2.37					
1986					1.85	2.42			1.96						
1987					1.76										

-Continued-

Brood Year	Age Group[a] 0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4
Male Mean Age Composition															
1978						0.19			0.03	0.03					
1979					0.76	0.41	0.01		0.04	0.13					
1980				0.02	0.52	0.55			0.19	0.54					
1981				0.00	0.11	0.20		0.00	0.11						
1982					0.15					0.19					
1983						0.42			0.05	0.05					
1984			0.00		0.34	0.83	0.01		0.02	0.05					
1985					0.09	0.19			0.48	0.54					
1986		0.00		0.00	0.28	0.20			0.11						
1987	0.00				0.15										
Female Mean Age Composition															
1978						0.26	0.00		0.01	0.01					
1979					0.73	0.45			0.02	0.15					
1980					0.52	0.63			0.12	0.53					
1981		0.01			0.10	0.24			0.13						
1982					0.10					0.18					
1983						0.38			0.06	0.02					
1984		0.00			0.38	0.88	0.00		0.02	0.02					
1985					0.08	0.21			0.52	0.53					
1986					0.25	0.24			0.13						
1987					0.10										

[a] Mean AWL data in this appendix reflect all corrections to the database and supersede previously reported AWL data. However, this does not imply that the data is completely free of keypunch or aging errors. See text for details.

Appendix B. Port Dick sockeye salmon mean length (mm), weight (kg), and age by brood year and age group.

Brood Year	Age Group[a] 0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4
Male Mean Length															
1986					485	520			479						
1987					479			331							
Female Mean Length															
1986					481	516			482						
1987					474										
Male Mean Weight															
1986					1.69										
1987					1.69										
Female Mean Weight															
1986					1.56										
1987					1.56										
Male Mean Age Composition															
1986					1.00	0.11			0.49						
1987					0.39			0.01							
Female Mean Age Composition															
1986					1.00	0.18			0.44						
1987					0.38										

[a] Mean AWL data in this appendix reflect all corrections to the database and supersede previously reported AWL data. However, this does not imply that the data is completely free of keypunch or aging errors. See text for details.

Appendix C. Nuka sockeye salmon mean length (mm), weight (kg), and age by brood year and age group.

Brood Year	Age Group[a] 0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4
Male Mean Length															
1978														535	
1979										574					
1980						572			509						
1981					500									571	
1982										582					
1983						573			537	595					
1984					508	580			544	572				582	
1985		618			518	577			504	575			539		
1986	531	586			498	580			516						
1987					504										
Female Mean Length															
1978														548	
1979										539					
1980						549			499						
1981		548			488						507			566	
1982										559			504		
1983						558			509	565					
1984					500	558	550	326	511	551				551	
1985		503			505	550	586		482	554			518		
1986	513	554			482	556			495						
1987					492										
Male Mean Weight															
1978															
1979										3.13					
1980						3.12			2.27						
1981					2.16										
1982										3.55					
1983						3.53			2.33						
1984					2.20	2.58				3.70				2.48	
1985					2.25	3.57			2.68	2.33			2.11		
1986	2.10				2.34	2.35			1.76						
1987					1.61										
Female Mean Weight															
1978															
1979										2.66					
1980						2.65			1.94						
1981					1.88						1.95				
1982										2.89					
1983						2.69			1.83	2.65					
1984					2.45	2.48				3.07				2.24	
1985					1.80	2.87			1.89	1.99					
1986					1.91	1.99			1.37						
1987					1.43										

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Brood Year	Age Group[a] 0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4
Male Mean Age Composition															
1978														0.01	
1979										0.07					
1980						0.76			0.07						
1981					0.09									0.01	
1982										0.50					
1983						0.28			0.14	0.10					
1984					0.07	0.56			0.02	0.10				0.01	
1985		0.01			0.30	0.56			0.18	0.30			0.01		
1986	0.01	0.01			0.16	0.50			0.11						
1987					0.08										
Female Mean Age Composition															
1978														0.00	
1979										0.09					
1980						0.64			0.12						
1981		0.00			0.14						0.01			0.01	
1982										0.36			0.01		
1983						0.30			0.19	0.15					
1984					0.13	0.48	0.00	0.01	0.05	0.10				0.01	
1985		0.01			0.31	0.56	0.00		0.16	0.27			0.00		
1986	0.01	0.01			0.18	0.47			0.14						
1987					0.11										

[a] Mean AWL data in this appendix reflect all corrections to the database and supersede previously reported AWL data. However, this does not imply that the data is completely free of keypunch or aging errors. See text for details.

Appendix D. China Poot sockeye salmon mean length (mm), weight (kg), and age by brood year and age group.

Brood Year	Age Group[a] 0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4
Male Mean Length															
1975						513									
1976					516	541									
1977					489			437		581					
1978						543			508	566					
1979					515	527	569		514						
1980				423	494	540			497						
1981					482	504									
1982					498					547					
1983						535			510	559					
1984					499	560		380	514	531					
1985				352	489	554		408	480	555			438		
1986				366	474	525		353	485						
1987				362	479			359							
Female Mean Length															
1975						524			509						
1976					511										
1977					491			513		570					
1978						538	512		526						
1979					514	549			502	548					
1980					494	540			493						
1981					483				497						
1982					494		633			526					
1983						551			508	563					
1984					494	566		442	517	575					
1985				341	488	546			473	550			487		
1986					473	533			479						
1987					478										
Male Mean Weight															
1975						2.20									
1976					2.17	2.61									
1977					2.17			1.14		2.95					
1978						2.65			2.03	2.90					
1979					2.14	2.66	3.85		2.26						
1980				0.94	2.02	2.91			2.43						
1981					2.26	2.14									
1982					1.96					2.83					
1983						2.70			2.45						
1984					2.38	3.63		1.80	2.00						
1985				0.70	1.83	2.83			1.70	2.10					
1986				0.50	1.54	2.46			1.80						
1987				0.70	1.69			0.50							

-Continued-

Brood Year	Age Group[a] 0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4
Female Mean Weight															
1975						2.40			1.95						
1976					2.00										
1977					1.98					2.70					
1978						2.85	2.50		2.03						
1979					1.98	2.80			1.97	2.88					
1980					1.90	2.91			2.26						
1981					2.11				1.70						
1982					1.80					2.20					
1983									2.07						
1984					1.77				2.75	2.60					
1985					1.76				1.51						
1986					1.49	2.10			1.63						
1987					1.57										
Male Mean Age Composition															
1975						0.03									
1976					0.97	0.04									
1977					0.89			0.07		0.01					
1978						0.00			0.01	0.00					
1979					0.96	0.03	0.01		0.03						
1980				0.02	0.94	0.21			0.28						
1981					0.50	0.42									
1982					0.58					0.04					
1983						0.04			0.49	0.01					
1984					0.37	0.06		0.03	0.12	0.01					
1985				0.03	0.79	0.14		0.00	0.22	0.01			0.01		
1986				0.01	0.57	0.05		0.02	0.36						
1987				0.04	0.57			0.01							
Female Mean Age Composition															
1975						0.07			0.05						
1976					0.88										
1977					0.96			0.04		0.00					
1978						0.01	0.00		0.01						
1979					0.98	0.01			0.09	0.02					
1980					0.89	0.19			0.24						
1981					0.55				0.25						
1982					0.75		0.00			0.02					
1983						0.06			0.50	0.02					
1984					0.42	0.06		0.00	0.11	0.00					
1985				0.00	0.82	0.08			0.27	0.01			0.00		
1986					0.65	0.07			0.40						
1987					0.52										

[a] Mean AWL data in this appendix reflect all corrections to the database and supersede previously reported AWL data. However, this does not imply that the data is completely free of keypunch or aging errors. See text for details.

Appendix E. Mikfik sockeye salmon mean length (mm), weight (kg), and age by brood year and age group.

Brood Year	Age Group[a] 0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4
Male Mean Length															
1979														529	
1980							505			521					
1981						520			449						
1982					457					515					
1983						513			479	535					
1984					462	533			493	511					
1985					475	504			471	502					
1986					441	501			456						
1987					464										
Female Mean Length															
1979															
1980										508			461		
1981						513			463						
1982		546			459					517					
1983						512			470	526					
1984					458	531			480	511					
1985					472	511			457	494					
1986					439	499			457						
1987					462										
Male Mean Weight															
1979															
1980							1.55			1.75					
1981						1.76			1.20						
1982					1.27					2.50					
1983						2.21			1.53	1.87					
1984					1.66	2.06			1.37	1.80					
1985					0.90	1.91			1.25	1.64					
1986					1.45	1.73			1.21						
1987					1.51										
Female Mean Weight															
1979															
1980										1.53					
1981						1.62			1.13						
1982		2.00			1.06										
1983						2.16			1.56						
1984					1.51	1.78			1.58	1.95					
1985					1.33	1.96			1.70	1.60					
1986					1.34	1.62			1.31						
1987					1.45										

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Brood Year	Age Group[a] 0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4
Male Mean Age Composition															
1979														0.01	
1980							0.01			0.02					
1981						0.65			0.07						
1982					0.24					0.02					
1983						0.55			0.05	0.08					
1984					0.38	0.74			0.10	0.15					
1985					0.09	0.37			0.06	0.02					
1986					0.42	0.67			0.16						
1987					0.15										
Female Mean Age Composition															
1979															
1980										0.03			0.01		
1981						0.54			0.13						
1982		0.01			0.28					0.01					
1983						0.49			0.05	0.05					
1984					0.45	0.71			0.12	0.12					
1985					0.12	0.40			0.05	0.04					
1986					0.43	0.53			0.22						
1987					0.20										

[a] Mean AWL data in this appendix reflect all corrections to the database and supersede previously reported AWL data. However, this does not imply that the data is completely free of keypunch or aging errors. See text for details.

Appendix F. Chenik sockeye salmon mean length (mm), weight (kg), and age by brood year and age group.

Brood Year	Age Group[a]														
	0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4
Male Mean Length															
1979															
1980						569									
1981					498	570			510						
1982					508		603			585					
1983						566			508	571					
1984					498	568		370	536	556					
1985					519	555			503	563					
1986		553			493	550			518						
1987	418				505										
Female Mean Length															
1979							516			538					
1980						543			468						
1981		548			486	531			489						
1982					486					561					
1983						537			490	544					
1984					485	543			505	523					
1985					495	534		325	485	513					
1986		538			469	531			492						
1987					481										
Male Mean Weight															
1979															
1980						2.81									
1981					2.08	2.20			1.75						
1982					1.64										
1983						2.60			1.98	2.30					
1984					1.71	2.50		0.90	2.18	2.30					
1985					2.05	2.47			2.18	1.99					
1986					1.91	1.71			1.59						
1987					1.40										
Female Mean Weight															
1979										3.60					
1980						2.44									
1981		3.00			1.88	1.83			1.46						
1982					1.39										
1983						2.01			1.55	1.90					
1984					1.54	2.03			1.75	1.90					
1985					1.53	2.04			1.51						
1986					1.52	1.50			1.38						
1987					1.10										

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Brood Year	Age Group[a] 0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4
Male Mean Age Composition															
1979															
1980						0.84									
1981					0.16	0.05			0.09						
1982					0.86		0.00			0.01					
1983						0.81			0.04	0.12					
1984					0.13	0.44		0.01	0.22	0.02					
1985					0.22	0.26			0.03	0.03					
1986		0.01			0.68	0.39			0.04						
1987	0.00				0.54										
Female Mean Age Composition															
1979							0.01			0.02					
1980						0.82			0.02						
1981		0.01			0.12	0.04			0.10						
1982					0.86					0.01					
1983						0.76			0.07	0.08					
1984					0.16	0.35			0.24	0.01					
1985					0.32	0.32		0.01	0.03	0.01					
1986		0.02			0.61	0.58			0.03						
1987					0.37										

[a] Mean AWL data in this appendix reflect all corrections to the database and supersede previously reported AWL data. However, this does not imply that the data is completely free of keypunch or aging errors. See text for details.